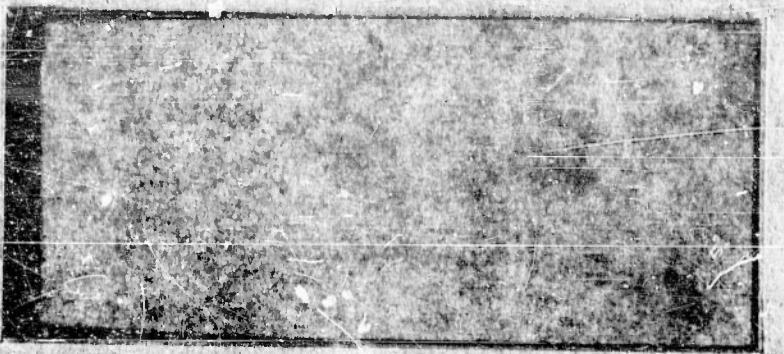


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General Mills, Inc.
Mechanical Division



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GENERAL RESEARCH & DEVELOPMENT

500 EAST HENNEPIN AVENUE
MINNEAPOLIS 11, MINN.

GENERAL MILLS, INC.
Mechanical Division
Engineering Research & Development Department
2003 E. Hennepin
Minneapolis 13, Minn.

FINAL REPORT

PROJECT 85008

REPORT NO. 1226

DATE: 4 SEPTEMBER 1953

PREPARED BY

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APPROVED BY

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Systems Group

I. INTRODUCTION

On 21 August 1952, Contract Noor 875(00) between General Mills, Inc. and the Office of Naval Research was amended to provide for the execution of an experiment designed to carry a scientific payload to high altitudes. A payload was supplied by the Naval Research Laboratory, Nucleonics Division. General Mills, Inc. was to supply a "Skyhook" balloon to carry the load aloft, together with balloon controls, recording and safety equipment. The flight was to be launched by General Mills technical personnel.

II. PROJECT PROGRAM

A traditional "Skyhook" balloon flight program was outlined for this project. The balloon was flown from Pyote Air Force Base, Pyote, Texas, on 29 August 1952. The following items constituted the flight train:

1. A polyethylene balloon, 85 feet in diameter, 1 mil thick.
2. A 28-foot parachute on which the instruments and payload were to be returned to earth.
3. A timer set to cut the load free from the balloon at a predetermined time when the scientific experiment is concluded.
4. Safety devices required by C.A.A., including a pressure switch set to prevent floating below 80,000 ft.
5. A barograph to give a record of the altitude reached.
6. A radio transmitter whose signal is modulated by a pressure sensor.
7. A payload provided by the Naval Research Laboratory, Nucleonics Division.

8. An additional small payload provided by the National Institutes of Health, Bethesda, Maryland.

Helium provided by the Navy was used for inflation.

The balloon and accessory equipment was flown successfully and the desired services were provided. Tracking was attempted using an Air Force AT-6 from Pyote Air Force Base. Poor mechanical condition prevented a successful tracking effort. The balloon landed in Mexico, and the equipment and payload were found and returned in good condition.

The flight data are presented in the next section of this report.

It is hoped that the scientific payload performed satisfactorily and that the entire operation met with success. General Mills, Inc. is happy to have had the opportunity of working with the Office of Naval Research and the Naval Research Laboratory in carrying out this experiment.

GRUMMAN MILLS, INC.
Engineering Research and Development Department
Minneapolis, Minn.

FLIGHT SUMMARY

Flight No.: 679

Date: 29 August 1952

Launch site: Pyote AFB

Launching time: 0657 CST

Balloon type: 851A

Serial No.: 501

Weight: 148#

Who: NRL - Shapiro

What: Plates, Beacon, Barograph & Timers

Scheduled duration: 10 1/2 hrs.

Load on Balloon: 117#

Actual Duration: 10 1/2 hrs.

Gross Load: 265#

Free lift: 34.5# 13% gross load

Maximum altitude: 101,000 ft.

Rate of rise: 1029 ft/min to 97,000 ft.

Theoretical Altitude: 101,800 ft.

Altitude Maintenance: Excellent

Recovery: where? 50 Mi. SW Douglas, Arizona.

Balloon Success: Excellent

Scientific Purpose: To carry plates for NRL Nucleonics Division.

Scientific Success as known: Late recovery caused much background on plates
though data very usable per Nat Seeman (NRL)

Critique: Launched in lee of hangar. Wind shear over hangar held balloon down after
leaving platform and dragged balloon 75 ft. on ground. High rate of rise.

A R I Z O N A

PHOENIX

ESTIMATED TRAJECTORY FROM WINDS ALOFT DATA:
EL PASO STATION REPORTS, 30300Z AND
TUCSON STATION REPORTS, 300300Z

IMPACT: 30 MI.
DOUGLAS, ARIZ.
8-16-52

ESTIMATED POSITION
AT RELEASE

MOLLOMANASH
445 C. Q. 53

+ LAUNCH SITE
PYOTE, TEXAS
DATE 0657.8-29-52
T
ESTIMATED POSITION
MAXIMUM ALTITUDE

A graph showing the relationship between CCl₄/180d (Y-axis) and 1231-180d (X-axis). The Y-axis has a break between 100 and 125. The curve is sigmoidal, starting at approximately (1231-180d, CCl₄/180d) = (1231, 100), passing through (1231, 125), and approaching a plateau of approximately 150 as 1231-180d increases.

STATUTE MILES

FEDERAL STANDARD TIME

PP. 5

11-20-52 321 321 6 3608 KIRL SHAPIRO, STILLER, FLOWN 25 AUG. 1952

